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I. INTRODUCTION

The San Francisco Bay/Delta (hereinafter "Bay/Delta"), an estuary marking the passage of the Sacramento and San Joaquin Rivers into the Pacific Ocean, is one of the most important bodies of water in the United States. It is the West Coast's largest estuary, encompassing nearly 1,600 square miles and draining over 40% of California. The Bay/Delta constitutes the most valuable wetlands area in the Western United States and is a critical link on the Pacific Flyway. It supplies habitat for over 120 fish species. In 1980, the Bay/Delta's fisheries were valued at $27 million, but this value has declined substantially in recent years. Suisun Marsh is also the largest contiguous brackish water marsh in the U.S. In addition to these environmental resources, however, the Bay/Delta is also the hub of the state's major water delivery system. Water is transferred from the Sacramento and other Northern California rivers to the South Delta, where massive pumps from the federal Bureau of Reclamation's (hereinafter "BOR") Central Valley Project (hereinafter "CVP") and the California Department of Water Resource's (hereinafter "DWR") State Water Project (hereinafter "SWP") deliver it through hundreds of miles of canals. The ultimate destination is farming areas in the San Joaquin Valley (which supplies 45% of the nation's fresh fruits and vegetables) and to over 15 million people in Southern California and 1.5 million in the South Bay.[1]

Bay/Delta water policy has witnessed a series of major controversies over the past thirty years. In the 1960s and much of the 1970s, the filling of the San Francisco Bay by land developers, ports, and airports was a major issue. Pollution from municipal treatment plants, industries, and surface runoff were additional concerns. In the late 1970s, attention shifted to population declines in most Bay/Delta fisheries due to various factors, such as water diversions (by the CVP, SWP, and upstream users), pollution, overfishing, and the 1987 to 1992 drought.[2]

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1. SAN FRANCISCO ESTUARY PROJECT, STATE OF THE ESTUARY (1992).

2. BRUCE HERBOLD ET AL., STATUS AND TRENDS REPORT: AQUATIC RESOURCES IN THE SAN FRANCISCO ESTUARY (1992).

Since 1989, over a half-dozen species native to the Bay/Delta have been proposed for listing under the federal Endangered Species Act (hereinafter "ESA").[3] The winter-run Chinook salmon was listed as threatened by the California Department of Fish and Game (hereinafter "DFG"), and then by the United States Fish and Wildlife Service (hereinafter "USFWS") in 1989. In 1994, its status was revised to endangered. The Delta smelt was listed as threatened under the ESA in March 1993. The Sacramento splittail has recently been proposed for threatened status by the USFWS. Several other species, including the spring-run Chinook salmon, the green sturgeon, and the Red Hills roach, may qualify for listing.[4]

While the listing of a species under the ESA is ostensibly a purely scientific enterprise, the evidence suggests there are many other considerations involved.[5] This is particularly true when, as in the case of Delta fisheries, enormous economic and political interests are at stake. For example, the biological opinions and take limits issued to protect the winter-run salmon and Delta smelt have been estimated to cost over one million acre-feet of water in critically dry years. This represents approximately 20% of the water pumped by the CVP and SWP, with economic costs of $15.8 million.[6] Given these stakes, one would expect to find interest groups with widely divergent opinions: environmental and fisheries groups favoring protection and San Joaquin farmers and Southern California water users opposing it.

The opinions of administrative agency officials and university scientists are less predictable. Here, there are at least two different schools of thought. According to what we shall term the "civics textbook model" (hereinafter "CTM") of public policy, agency officials and scientists should act in a completely neutral fashion, and it is assumed they usually do so. In contrast, the "advocacy coalition framework" (hereinafter "ACF") assumes that most agency officials and university scientists actively involved in policy disputes will join with like-minded interest group leaders and elected officials to form advocacy coalitions, i.e., actors from different institutions who share a set of beliefs and seek to alter policy consistent with those beliefs.

This Paper first presents the two models and discusses their implications for the policy beliefs of various types of officials. We then compare the views of different categories of interest group leaders, administrative agency officials, and university scientists as revealed by a 1992 mail survey of Bay/Delta water policy activists. As analyzed below, the data provide much stronger support for the ACF than for the CTM. The concluding section discusses some implications of the results.

II. TWO MODELS OF PUBLIC POLICY

The two models discussed below seek to describe the roles played by policy activists in relatively technical policy domains where scientific evidence is important. Endangered species policy and Bay/Delta water policy would certainly meet this criterion.

A. The Civics Textbook Model

The CTM is basically a normative model, derived from certain fundamental principles of democratic theory. It assigns very distinct roles to three categories of actors in the policy process.[10] While this model is something of a straw man, it is alive and well on the editorial pages of many newspapers. It is also held by many agency officials and university researchers, although we have no systematic evidence of this. It was advocated by many civil service reformers and progressives in the early twentieth century and continues to find support among some respected academics.[7]

(1) Scientists are supposed to be neutral seekers of the truth. Their role is to understand the world and to present this information to policymakers. When serving as policy advocates, they should make their normative assumptions explicit.

(2) Elected officials are responsible for making basic policy decisions in a manner which reflects the distribution of values in society. They use scientific findings to help them understand trends in various problems, the factors affecting them, and the means of alleviating those problems. Their basic role is to establish clear laws (and budgetary priorities) for implementation by agencies.

3. 16 U.S.C. § 1531 (West 1994).

4. PETER B. MOYLE & R.M. YOSHIYAMA, FISHES, AQUATIC DIVERSITY MANAGEMENT AREAS, AND ENDANGERED SPECIES: A PLAN TO RESTORE CALIFORNIA'S NATIVE AQUATIC BIOTA (1992).

5. STEVEN YAFFEE, PROHIBITIVE POLICY: IMPLEMENTING THE FEDERAL ENDANGERED SPECIES ACT (1982); RICHARD TOBIN, THE EXPENDABLE FUTURE: U.S. POLITICS AND THE PROTECTION OF BIOLOGICAL DIVERSITY (1990).

6. 40 CFR § 131 (1994). This assumes that CVP and SWP exporters bear all the water costs, but that water transfers are available. Without transfers, the costs increase to $28.3 million in average years and $165.3 million in critically dry years. If costs are shared by all divertors, the economic welfare losses decrease to $0.5 million for average years and $5.5 million for dry years.

7. Paul Sabatier & Matthew Zafonte, *Are Bureaucrats and Scientists Members of Advocacy Coalitions?* (1994) (on file with authors)

(3) Governmental agencies are composed largely of civil servants who should be politically neutral and who have a special role in fostering applied research in areas of interest to the agency. Political appointees within the agency are responsible for seeing that the agency reflects the Administration's priorities to the extent permitted by law.

This normative model describes how science *should* be used in making public policy. Evidence suggests that many scientists and agency officials involved in policy disputes do, in fact, view themselves as "objective technicians".[8]

B. Limitations of the CTM

The CTM has substantial limitations in practice, in large part because many people do not behave as the model indicates they should.

(1) Scientists are often not neutral participants. Virtually all scientists operate within a specific "paradigm," which provides implicit assumptions about basic causal relationships and proper methods of investigation, thereby guiding research.[9] As part of these paradigms, almost all scientific disciplines contain important normative assumptions which many members come to accept in an uncritical fashion. For example, civil engineers generally assume that nature exists for human purposes and that they can mitigate virtually all negative impacts arising from their projects. In contrast, many wildlife biologists tend to view virtually all species as having intrinsic worth and are very skeptical of the ability of humans to manipulate natural systems without unforeseen adverse consequences on one or more species. With respect to nuclear waste disposal, Barke and Jenkins-Smith have recently provided evidence that biologists perceive significantly greater risks than physicists, chemists, and engineers; while the latter think basically in terms of dose-response curves, biologists are wary of the effects of any dose on living organisms.[10]

As a further limitation to the CTM, many scientists work for governmental agencies. Of the 151 respondents to our Bay/Delta survey who had advanced degrees and considered themselves to be scientists, 82 (54%) worked for administrative agencies. As such, they usually come to share the agency's "culture," whether out of self-selection or socialization.[11]

Finally, scientists employed by universities are often drawn to applied rather than basic research because they want to help solve a particular problem. Having a demonstrable effect on policy, however, normally requires the accumulation of results over an extended period of time.[12] The more neutral and "apolitical" scientists are unlikely to remain interested in an issue long enough to have such an impact. Thus, the most active scientists in a particular dispute are likely to be those who have been involved the longest and who are most committed to defending a particular point of view.

The end result is that scientists who have something to contribute to important policy disputes are seldom neutral.[13] We are not suggesting they manipulate or falsify data. Instead, disciplinary paradigms, values underlying the discipline, and the desire to solve particular problems affect various aspects of a scientist's work, including the topics chosen to research, the methods utilized, how uncertainty is treated, where the burden of proof is placed, and how quickly various results are presented. For example, wildlife biologists are more likely than engineers to look for species in trouble because their disciplinary norms define species extinction as a serious problem. They are more likely to look to human technological interventions as a likely explanation because they tend to respect the beauty of natural systems. In contrast, engineers assume they can improve on nature. Members within each discipline will readily present results which are congruent with these assumptions, while incongruent results are likely to be interpreted as tentative and in need of further verification.[14]

(2) Elected officials seldom pass clear laws on contentious issues with substantial technical components because very few have the expertise to understand the technical issues. Instead, they tend to pass procedural laws which hand over the problem to an administrative agency without clear policy priorities.[15] The federal and California Endangered Species Acts are perfect examples.

8. ARNOLD MELTSNER, POLICY ANALYSTS IN THE BUREAUCRACY (1976).

9. THOMAS KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (2d ed. 1970); Imre Lakatos, *History of Science and its Rational Reconstruction*, *in* BOSTON STUDIES IN THE PHILOSOPHY OF SCIENCE (1971).

10. Richard Barke & Hank Jenkins-Smith, *Politics and Scientific Expertise: Scientists, Risk, Perception, and Nuclear Waste Policy*, *in* RISK ANALYSIS (1992).

11. ASHLEY SCHIFF, FIRE AND WATER: SCIENTIFIC HERESY IN THE FOREST SERVICE (1962); DONALD C. PELZ & FRANK M. ANDREWS, SCIENTISTS IN ORGANIZATIONS (1976).

12 Carol Weiss, *Research for Policy's Sake: The Enlightenment Function of Social Research*, POLICY ANALYSIS, Fall 1977, at 531.

13 *See also* HOWARD MASSOLIS, TECHNICAL ADVICE ON POLICY ISSUES (1974), ALLAN MAZUR, THE DYNAMICS OF TECHNICAL CONTROVERSY (1931).

14. HAROLD BROWN, PERCEPTION, THEORY AND COMMITMENT (1977).

15 THEODORE LOWI, THE END OF LIBERALISM (1969); William Gormley, *Regulatory Issue Networks in a Federal System*, POLITY, Summer 1986, at 595.

(3) Agency officials are seldom as neutral as the civil servants in the Weberian model of bureaucracy.[16] Most agencies involved in the long-standing controversy surrounding the protection of the Bay/Delta—whether it be the BOR, state and federal fish and game agencies, the Bay Conservation and Development Commission (hereinafter "BCDC"), the U.S. Environmental Protection Agency (hereinafter "EPA"), or California water agencies—have a fairly clear overall mission which tells them to give priority to some values over others. Most officials who join an agency come to accept those priorities, whether out of self-selection or gradual indoctrination. Agencies are often dominated by members of a particular profession or scientific discipline who share the norms of colleagues outside the agency.[17] Finally, any agency must be sensitive to the wishes of interest groups and legislators who play influential roles in allocating budgetary and statutory resources if it is to survive and prosper.[18] Thus, most agencies can be expected to sponsor research consistent with their mission and to be skeptical of findings which cast doubt on its wisdom.

In sum, very few participants in a policy dispute can be expected to behave in a manner consistent with the CTM. Scientists who are actively involved are seldom neutral. Elected officials seldom make clear value choices. Agency officials are normally (and properly) concerned with promoting a legal and/or professional mission accumulated over a number of years. Therefore, any model which assumes neutrality on the part of most participants is seriously flawed.

C. The Advocacy Coalition Framework

The Advocacy Coalition Framework (hereinafter "ACF") was developed by Sabatier to understand policy change over periods of a decade or more within a particular substantive domain or subsystem, such as air pollution control or grade school through high school education.[19] One of the ACF's goals is to integrate political scientists' traditional preoccupation with socio-economic conditions, political ideologies, and political institutions with policy scholars' concern with the role of policy analysis and scientific information in the policy process. To accomplish this, the ACF has to deal explicitly with the factors affecting the behavior of professionals and scientists working in agencies, consulting firms, universities, and the like. It does so by developing the concept of an advocacy coalition.

An advocacy coalition consists of interest group leaders, legislators, agency officials, researchers, and journalists who share a set of basic beliefs (policy goals plus perceptions of important causal relationships and variable states) and who engage in some degree of coordinated activity in order to alter the rules of governmental institutions over time.[20] In Lake Tahoe environmental policy, for example, Sabatier and Brasher found two quite distinct coalitions in the 1970s and early 1980s: an environmental coalition composed of environmental groups, federal and state pollution control agencies, university researchers affiliated with the Tahoe Research Group, and several out-of-Basin California legislators; they were opposed by an economic development/property rights coalition composed of local chambers of commerce, realtors and property rights groups, most local government officials, most public utility district officials, and most local legislators.[21] Conflict among coalitions is mediated by "policy brokers," i.e., powerful actors more concerned with fashioning an acceptable compromise than with achieving specific policy goals.

The belief systems of various coalitions are organized into an hierarchical, tripartite structure with higher and broader levels generally constraining more specific beliefs.[22] At the highest, broadest level, the "deep core" of the shared belief system includes fundamental normative beliefs, such as the familiar Left/Right scale, which operate across virtually all policy domains. At the next level are "policy core" beliefs which represent a coalition's basic normative commitments and causal perceptions across a policy domain or subsystem. Finally, the "secondary aspects" of a coalition's belief system within a specific policy domain comprise a large set of narrower beliefs concerning the seriousness of the problem or the relative importance of

16. JACK KNOTT & GARY MILLER, REFORMING BUREAUCRACY (1987).

17. Robert Bell, *Professional Values and Organizational Decision-Making*, ADMINISTRATION AND SOCIETY, May 1985, at 21; Marc Eisner & Kenneth Meier, *Presidential Control versus Bureaucratic Power: Explaining the Reagan Revolution in Antitrust*, AMER. JOURNAL OF POLITICAL SCIENCE, February 1990, at 269.

18. JERRY PFEFFER & GERALD SALANCIK, THE EXTERNAL CONTROL OF ORGANIZATIONS (1978).

19. Paul Sabatier, *An Advocacy Coalition Framework of Policy Change and the Role of Policy-Oriented Learning Therein*, POLICY SCIENCES, Summer/Fall 1988, at 129.

20. PAUL SABATIER & HANK JENKINS-SMITH, POLICY CHANGE AND LEARNING: AN ADVOCACY COALITION APPROACH 25 (1993)

21. Paul Sabatier & Anne Brasher, *From Vague Consensus to Clearly-Differentiated Coalitions: Environmental Policy at Lake Tahoe, 1964–85*, *in* POLICY CHANGE AND LEARNING 177 (Paul Sabatier & Hank Jenkins-Smith eds., 1993).

22. *See also* Mark Peffley & Jon Hurwitz, *A Hierarchical Model of Attitude Constraint*, AMERICAN JOURNAL OF POLITICAL SCIENCE, November 1985, at 871.

various causal factors in specific locales, policy preferences regarding desirable regulations or budgetary allocations, the design of specific institutions, and the evaluations of various actors' performance. The ACF assumes that coalition actors use selective perception and a variety of other devices to screen their beliefs from challenge, particularly at the deep core and policy core levels. Given that beliefs are resistant to change, the composition of coalitions is hypothesized to be stable over periods of a decade or more.

The ACF explicitly rejects the assumption that most bureaucrats and researchers involved in a policy area will be neutral. Some may well have no strong policy preferences, at least initially. But the ACF contends that, as conflict between coalitions increases and as the interrelationships among sets of beliefs become clearer over time, initially loose groups with amorphous beliefs will coalesce into increasingly distinct coalitions with coherent belief systems. In this process, most neutral actors, particularly university scientists, will drop out.[23] The ACF thus contends that, in well-developed subsystems, most active agency officials and researchers will be members of specific coalitions sharing a set of policy core beliefs and acting in concert to some degree.

The ACF does not, however, assume that university scientists and agency officials will be indistinguishable from interest group leaders, particularly in their behavior. Instead, agency officials will usually be more moderate in their beliefs, particularly in their public expression, because they must be cautious about offending the multiple principals upon whom they depend for legal and budgetary resources.[24] Similarly, university researchers should be more willing than their professional colleagues in agencies and interest groups to alter important perceptions in the policy core and secondary aspects because they are not constrained by the official position of their organization on such topics.

D. Contrasting Hypotheses from the Two Models

The ACF clearly expects agency officials and university researchers to have belief systems involving basic values, perceptions, and policy preferences which are very similar to their interest group allies, although perhaps in more moderate positions.

In contrast, the CTM would first expect agency officials and university researchers to be grouped around the population mean on all scales involving normative items or policy preferences. The CTM contends that civil servants and university researchers either have no coherent policy belief systems, in which case their responses will regress to the population mean, or, in the case of civil servants, they select "middle-of-the-road" belief systems which are least likely to raise the ire of their politically-appointed superiors from different political parties. Second, the neutral expertise argument would expect civil servants and university researchers to have much less coherent policy belief systems than interest group leaders and legislators.

III. DATA BASE

The data base for this Paper comes from responses to a 14-page questionnaire mailed in the winter of 1992–93 to our estimate of the set of policy activists who in 1992 were informed and actively seeking to influence some aspect of Bay/Delta water policy (e.g., fill, water quality, and/or flows). The names were obtained from three sources: (1) people active in the San Francisco Estuary Project or in State Water Resources Control Board (hereinafter "SWRCB") hearings on the Bay/Delta (hereinafter "Bay/Delta Hearings"), (2) the major officials in critical agencies and interest groups concerned with some aspect of Bay/Delta water policy, and (3) people nominated as influential by the advisory committee to our project. This produced a census of 779 names, of whom 427 responded, for an overall response rate of 55%.[25] In addition, 20 people were added from a companion 1984–92 panel survey when they said they were as active in 1992 as they had been in 1984 (even though they had not made our original list of 1992 policy elites).[26] Finally, since we are primarily interested in comparing the responses of policy activists from different institutions, 18 people are counted twice because they

23. For evidence concerning land use policy at Lake Tahoe, *see* Paul Sabatier & Susan McLaughlin, *Belief Congruence Between Interest Group Leaders and Members*, JOURNAL OF POLITICS, August 1990, at 914; Sabatier and Brasher, *supra* note 21.

24. Hank Jenkins-Smith & Gilbert St. Clair, *The Politics of Offshore Energy: Testing the Advocacy Coalition Framework*, *In* POLICY CHANGE AND LEARNING 149 (Paul Sabatier & Hank Jenkins-Smith eds., 1993).

25. The number of respondents and the response rate for various categories of actors:

Category	Number of Respondents	Response Rate
Federal & state govt (includes 3 legislatures)	96	60%
Bay local & regional govt & public dischargers	93	52%
Central Valley govt & interest groups	32	56%
Southern California govt & interest groups	22	65%
Bay business, ports, & private dischargers	56	44%
Environmental and sportsmen's groups	47	58%
Consultants, univ researchers, educ fans	62	55%
Journalists and misc.	6	33%
Unknown (removed ID)	8	dk
	427	55%

26 These included 6 environmental group leaders, 5 POTW officials, 2 local government officials, and 2 consultants.

hold two positions: one on the board of a regional agency, the other as a state or local government official.[27] Thus, our data set consists of 465 respondents.

IV. RESULTS

In order to test the competing hypotheses, we first grouped our 465 respondents into a reasonable number of organizational affiliations. The bulk of the analysis consists of arraying officials from different organizations on a variety of attitudinal scales dealing with endangered species policy to see if agency officials and university researchers cluster around the population mean, as predicted by the CTM, or, instead, are allied with interest groups in discernible coalitions, as predicted by the ACF. Next will come several regression analyses to see if civil servants have belief systems which are as coherent or constrained as other actors.

A. Categories of Organizational Affiliation

Our 465 respondents came from over one hundred organizations which play a recurring role in Bay/Delta water policy. To reduce these to a reasonable number, we grouped them into the following twenty categories of organizational affiliation. Different organizations were collapsed into the same affiliation category (a) if they had similar functions and/or locale (e.g., Bay local governments) and (b) if their respondents expressed similar views on our attitudinal scales.

(1) BOR/DWR (n=20). These were officials, primarily civil servants, from the BOR and the DWR, the agencies that operate the CVP and SWP, sending water from the Delta to the San Joaquin Valley, Southern California, and the South Bay (San Jose).

(2) U.S. Army Corps of Engineers (n=8). These were civil servants from the U.S. Army Corps of Engineers (hereinafter "Corps"), the federal agency primarily responsible for regulating dredging and construction in wetlands.

(3) USFWS/NMFS (n=13). These were officials, primarily civil servants, from the USFWS and the National Marine Fisheries Service (hereinafter "NMFS"), the two federal agencies responsible for fisheries and endangered species.

(4) DFG (n=11). These were officials, primarily civil servants, from the DFG. While their views generally paralleled those of their biologist colleagues in the two federal wildlife agencies, state agency personnel differed on some issues (e.g., the Peripheral Canal) and thus were kept separate.

(5) EPA/Misc. Resource Agencies (n=30). About a third of this group (sometimes referred to as the "EPA group") came from the EPA, with the rest coming from a variety of federal and state natural resources agencies, including the State Lands Commission, the California EPA, and the U.S. Soil Conservation Service; almost all were civil servants.

(6) SWRCB (n=11). These were officials, primarily civil servants,[28] from the SWRCB, the state agency primarily responsible for both water quality and water rights/flows. Under the SWRCB were several regional boards, including two in our survey. Respondents from the three organizations expressed different enough views that we decided not to aggregate them.

(7) San Francisco RWQCB (n=13). These were board members and senior staff (most of the latter being civil servants) from the San Francisco Regional Water Quality Control Board (hereinafter "SFRWQCB"), the regional board with jurisdiction over San Francisco Bay and a portion of the Delta.

(8) Central Valley RWQCB (n=10). Similarly, these were board members and senior staff from the Central Valley Regional Water Quality Control Board (hereinafter "CVRWQCB"), the regional board with jurisdiction over the Sacramento Valley, the San Joaquin Valley, and the remainder of the Delta.

(9) BCDC/Misc. Regional Agencies (n=29). These were primarily board members and staff from the BCDC, which regulated building and fill along the Bay shoreline. This group (sometimes referred to as the "BCDC group") contained a few people from other Bay Area regional parks and planning agencies.

(10) Bay/Delta Local Government (n=43). These were elected officials and senior staff from general purpose local governments and water supply agencies in the Bay/Delta.

27. Of the 18, 14 are members of the BCDC who are also local or state government officials; 3 are members of the board of the CVRWQCB (as well as leaders of water districts or major agricultural organizations); and one is with the Aquatic Habitat Institute (as well as the SFRWQCB).

28. In fact, only one of the five board members responded, so the data presented here should be interpreted as the views of the senior staff concerned with the Bay/Delta

(11) Southern California (n=22). These were elected officials and senior staff from water agencies in Southern California who either testified at Bay/Delta Hearings or were on the boards of the SWP or CVP Contractors Associations.

(12) San Joaquin Valley/Statewide Agriculture (n=25). These were primarily elected officials or senior staff from water or irrigation districts in the San Joaquin Valley who testified at Bay/Delta Hearings or were on the CVP/SWP boards. It also included seven representatives of statewide agricultural organizations—such as the Farm Bureau, Grange, and Agricultural Chemicals Association—who testified at the Bay/Delta Hearings and whose responses were very similar to those from the San Joaquin Valley.

(13) Sacramento Valley (n=10). These were officials from general purpose local governments slightly upstream of the Delta or from water districts in the Sacramento Valley (i.e., north of the Delta) who testified at the Bay/Delta Hearings or were active in the Estuary Project.

(14) University/Misc. Researchers (n=32). These were primarily university faculty who had been active in Bay/Delta research; it also included a few researchers from institutes in the Bay Area, such as the Tiburon Center. Most of these names were taken from the lists of technical advisors to the Estuary Project.

(15) Consultants (n=23). These were researchers in consulting firms who had been active on Bay/Delta water issues, either as advisors to the Estuary Project or as participants before Bay/Delta Hearings.

(16) Private Dischargers (n=28). These were primarily water quality specialists with industries that discharged wastes either directly or indirectly (via sewer systems) into the Bay/Delta.

(17) Public Dischargers (n=27). These included board members and senior staff from the five publicly-owned sewage treatment works (hereinafter "POTWs") in the Bay Area or the association of such dischargers.

(18) Business/Ports (n=27). This included 14 representatives from business associations (primarily the Bay Planning Coalition) and 13 from ports and airports in the Bay Area. These groups tended to have similar views, in part because of their common interest in development along the Bay shoreline.

(19) Environmental/Sportsmens Groups (n=54). These were the senior staff and critical board members from the principal environmental and fishing/hunting groups concerned with the Bay/Delta.

(20) Other (n=28). This was a miscellaneous group composed of journalists, leaders of educational fora, union leaders, a few state legislators, and anonymous respondents. This category was not mentioned in most of our analyses, although its members were included in the overall means.

This diverse set of officials from agencies and legislators at multiple levels of government, interest groups, and researchers is typical of many policy subsystems.[29]

B. Positions of Agencies, Researchers, and Interest Groups on Endangered Species Issues

This section provides the mean scores for each organizational category on a variety of endangered species issues. Each figure also provides the overall population mean, standard error bars for each organizational category, and an indication of whether the means for specific organizational categories are significantly different from the overall mean.[30] The data are for all members of an organizational category, since this is what the ACF and most observers are interested in. We realize, however, that the CTM applies primarily to civil servants. In most cases, there is no statistically significant difference between civil servants and elected or appointed officials within an organizational category;[31] in cases where there is—chiefly involving the SFRWQCB and CVRWQCB—these are noted in the figures. The various attitudes relevant to

29. R.A.W. Rhodes, Beyond Westminster and Whitehall (1988); Bernard Marin & Renate Mayntz, Policy Networks (1991); John P. Heinz et al., The Hollow Core (1993).

30. We used a two-tailed t-test to determine if the mean for a specific organizational category was significantly different from the overall population mean. If the variance for the organizational category differed significantly ($p<.05$) from the population mean, we used an unequal variance test; if it didn't, we used an equal variance test.

31. We compared the views of civil servants versus elected officials and political appointees for six categories of agencies (BOR/DWR, the EPA group, the BCDC group, Bay local governments, Southern California water districts, and San Joaquin Valley water districts) on 13 attitudinal and perceptual items. There were statistically significant differences on six of those 78 relationships, or slightly greater than would be expected by chance at the .05 level and slightly less than chance at the .10 level. On the CVRWQCB and SFRWQCB, however, there were significant differences ($p<.05$) on 11 of the 26 items; in all cases, the boards were more conservative and less environmental than the staff.

endangered species policy are arranged according to ACF categories: (1) is a purely normative scale in the deep core, (2) provides scales combining normative and perceptual items in the policy core, (3) indicates purely perceptual items, and, finally, (4) is two policy preferences.

1. *Utilitarian View of Nature Scale.*

Figure 1 presents the data for a seven-item scale representing a Utilitarian View of Nature. High scores on this scale reflect strong agreement with statements such as "one person's right to a clean environment is not as important as another's right to gainful employment," "plants and animals exist primarily for man's use," and "mankind was created to rule over the rest of nature."[32] Low scores reflect strong disagreement with such views. The assumption, which shall be tested later in the Paper, is that officials' general views toward humans' role in nature will affect their attitudes toward specific endangered species issues.

Note that the overall mean is 2.77, indicating that most of the respondents to our survey disagreed with utilitarian views.[33] Within this context, however, most members of the organizational categories at the top right of the figure[34] held relatively utilitarian views which were significantly different from the overall mean.[35] It is interesting to note that, for the SFRWQCB, civil servants ("CS") had relatively anti-utilitarian views while the political appointees ("PA"), i.e., board members, held relatively utilitarian views which were very similar to those of San Joaquin farmers and Southern California water districts. This is hardly surprising, given that most of the staff in the winter of 1992–93 were water quality specialists, while the board was appointed by a Republican Governor from Southern California who had strong political ties to San Joaquin farmers. Finally, at the bottom left of the figure are the groups reflecting strongly anti-utilitarian views. These included officials from environmental and/or sportsmens groups, the federal and state fisheries agencies, the EPA and other resource agencies, the BCDC and other Bay regional agencies, and university researchers.

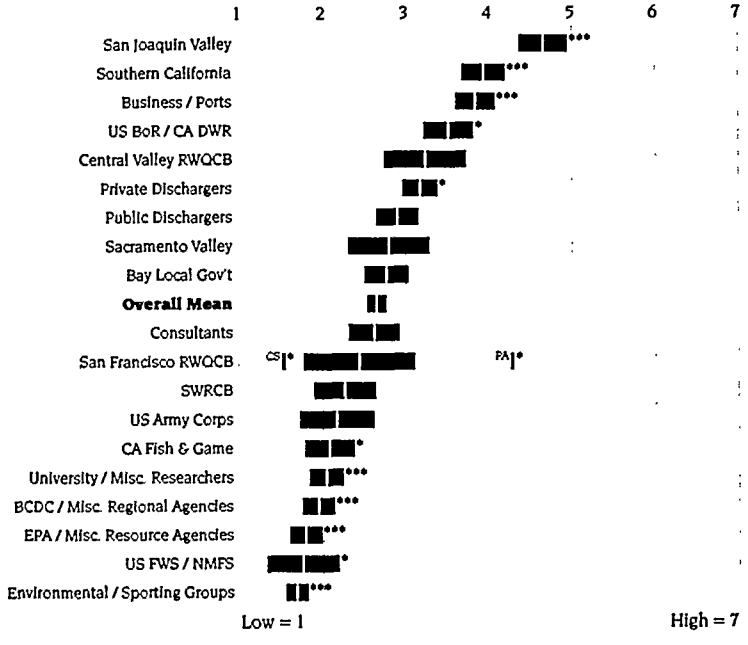

Figure 1
Mean scores of affiliation categories on
Utilitarian View of Nature Scale
with standard error bars and probabilities of being different than the overall mean.
*, **, *** = significant at the .05, .01, and .001 levels respectively
All two-tailed

These data are more supportive of the ACF than of the CTM. First, university scientists held views which were much more environmentally protective (anti-utilitarian) than the overall mean. Second, of the nine categories of administrative agency officials, five comprised people whose views, on average, differed significantly from the overall mean and a sixth, the SFRWQCB, had staff and political appointees whose views each differed from the overall mean.[36]

32. The ACF would characterize this as a "deep core" scale because it applies to all of environmental policy, while the subsystem of interest is restricted to Bay/Delta water policy.

33. An overall mean of 4.00 would indicate ambivalence on a seven-point scale, while a mean of 1.00 would be extremely opposed, and a mean of 7.00 would be extremely supportive.

34. In other words, San Joaquin farmers, Southern California water districts, Bay businesses and ports, agency officials from the BOR and DWR, and private dischargers from the Bay Area.

35. Three asterisks (***) indicate there is only one chance in a thousand that San Joaquin farmers did not differ from the overall mean. One asterisk (*) means there is a 5% probability that BOR/DWR officials did not differ from the overall mean.

36. The use of the mean for a given organizational category will *underestimate* the extent to which individuals within that category differ from the population mean. For example, the mean for officials from Bay local governments is very similar to the overall mean, of the 43 local government officials However, 14 held views higher than 3.3 (where means of categories started being significantly dif-

Only Bay local government officials had, on average, views closely approximating the overall mean. On the other hand, officials from the SWRCB and the Corps tended to hold relatively anti-utilitarian views; however, their views were not great enough to differ significantly from the overall mean (at the .10 level).

2. *Two Bay/Delta Scales.*

We now examine two attitudinal scales composed of items dealing with the Bay/Delta. The first consists of seven statements dealing with various aspects of environmental policy in the Bay/Delta, such as "we cannot afford to let policies claiming to promote environmental quality prevent the continued economic development of the Bay Area" and "protection of Bay water quality requires that regulations be rigorously enforced, even when they create hardships for dischargers." The scale is constructed in such a way that a high score indicates perceptions that environmental problems are serious, that environmental quality should be a priority value, and that state and federal intervention is necessary to solve those problems.[37] (For details of scale construction, see Appendix.)

The data for Figure 2 are quite similar to those in the previous section. The means for most categories were greater than 4.0, suggesting that virtually no group of activists felt environmental quality in the Bay Area was a minor problem which could safely be left to local officials. Within this loose consensus, activists in federal and state fisheries agencies, environmental groups, the EPA group, the BCDC group, university researchers, and, in this case, SWRCB staff, were on the very high end of the scale (means greater than 5.7), while those for San Joaquin farmers, Southern California water districts, Bay businesses/ports, and both public and private dischargers in the Bay tended to be relatively neutral, with their means significantly lower than the overall mean.

The next scale (Figure 3) is narrower in scope, consisting of three items regarding Bay/Delta fisheries. These issues were the perceived impact of upstream dams and diversions on Delta fisheries, a preference that instream flow requirements be sufficient to restore fish populations to pre-1976 levels, and a perception that the weight of political power in the southern half of the state would not be kind to Bay water quality. (For details of scale construction, see Appendix.)

The means on this scale vary more than on the previous ones, ranging all the way from a low of 1.9 for San Joaquin Valley farmers to a high of 6.4 for environmental/sportsmens groups, suggesting potential for much greater conflict. But the coalitions are, for the most part, quite familiar. At the low end, with means significantly different from the overall mean, were San Joaquin farmers, Southern California water districts, the BOR/DWR, and political appointees (but not civil servants) to the CVRWQCB. At the high end were environmental groups, the federal and state fisheries agencies, the BCDC group,

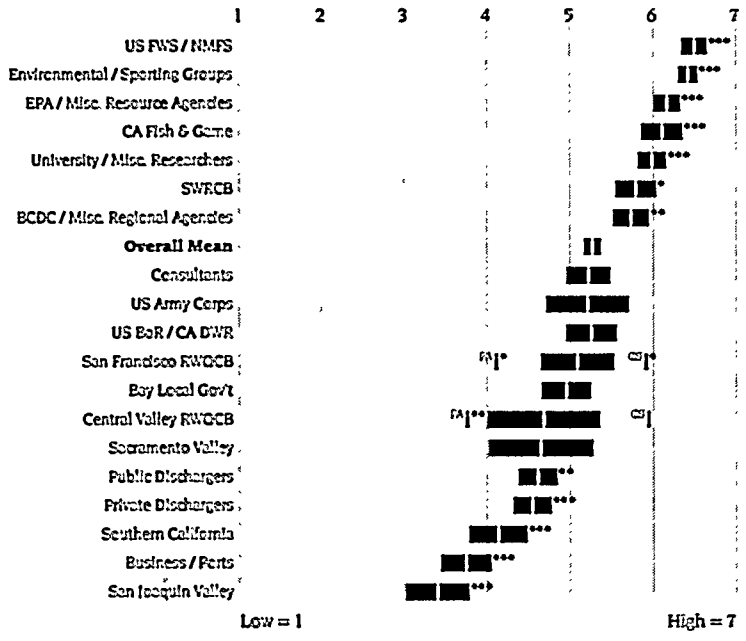

Figure 2
Mean scores of affiliation categories on
Bay-Delta Environmental Concern Scale
with standard error bars and probabilities of being different than the overall mean.
*, **, *** = significant at the .05, .01, and .001 levels respectively
All two-tailed

ferent from the overall mean) and 17 had scores less than 2.2 (the level at which categorical means were different from the overall mean). Within the BOR/DWR category, there was less variance, with only four of 20 respondents below 2.2 (or even 3.0).

37 Although these do not necessarily go together, the fact that they scaled together indicates that, for this set of respondents, the perceived seriousness of Bay environmental problems and the need for extra-local intervention were, in fact, highly inter-correlated.

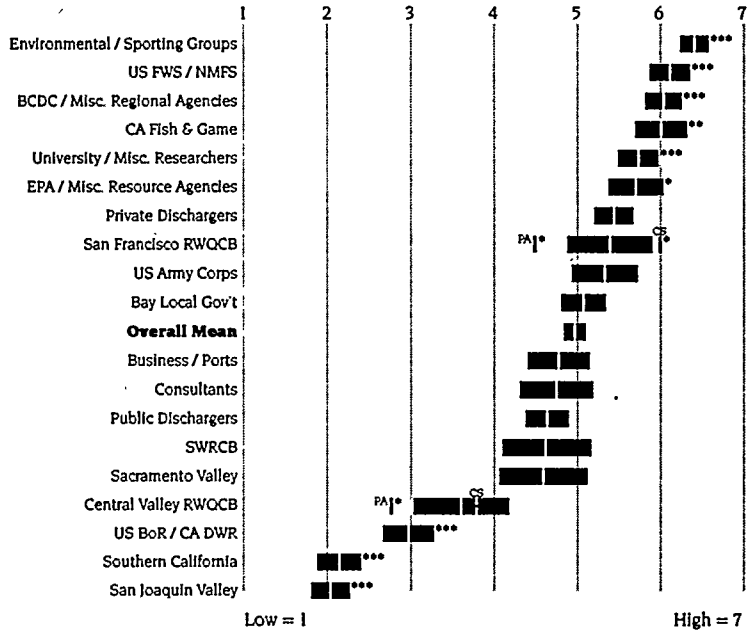

Figure 3

Mean scores of affiliation categories on

Concern for Flows / Fisheries Scale

with standard error bars and probabilities of being different than the overall mean.

*, **, *** = significant at the 05, 01, and .001 levels respectively
All two-tailed

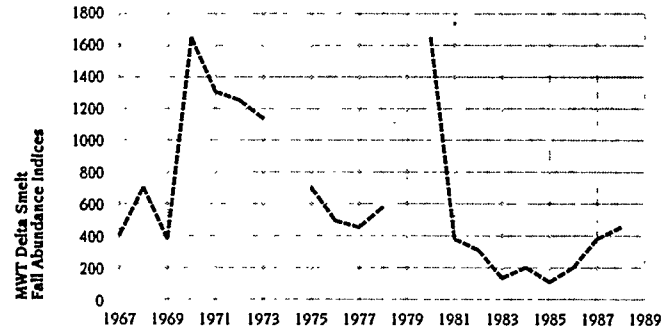

Figure 4

Delta Smelt Fall Abundance Indices for the Midater Trawl Survey for Years 1967–73, 1975–78, 1980–89

to those of environmental/fisheries groups, rather than being neutral. Second, the means of most agency categories have been significantly different from the overall mean. Officials from the BOR/DWR and Southern California water districts have been consistently on the utilitarian (anti-environmental) end of the spectrum, while officials from federal and state fisheries agencies, EPA and other state/federal resource agencies, and BCDC and other Bay regional planning agencies have tended to be at the anti-utilitarian (pro-environmental) end. On the other hand, officials from Bay local governments, the Corps, and SWRCB staff have generally been relatively close to the overall mean. Finally, while civil servants on the CVRWQCB have been relatively close to the overall mean, their counterparts on the SFRWQCB have generally been part of what might be termed "the environmental coalition."

3. *Perceptions Relating to Endangered Species.*

We now turn to three items relating to endangered species. The first, shown in Figure 4, concerns interpretations of a graph of the fall abundance of Delta smelt populations in the period from 1967 to 1990.

Interestingly, two professional wildlife biologists, Randy Brown of DWR and Peter Moyle of the University of California, Davis, have proposed quite different interpretations of this graph. Brown saw it as evidence that smelt populations were small but stable, while Moyle interpreted it as suggesting the smelt should be listed as a threatened species.[38] The graph and a set of five interpretations were included in our survey of Bay water policy activists.

The results, shown in Figure 5, indicate that professional standards of data interpretation appear to have been at work. With the exception of environmental groups, the means for all organizational categories were between 2.6 and 3.7, suggesting that relatively few agency (or even interest group) offi-

the EPA group, university researchers, civil servants (but not political appointees) to the SFRWQCB, and, to a slightly lesser extent, private dischargers.

Thus far we have discussed three attitudinal scales comprising a mixture of problem perceptions and policy preferences dealing with environmental quality. The results are much more consistent with the ACF than with the CTM. First, university scientists have demonstrated points of view quite similar

38. Randall Brown, *Impacts of State Water Project Operations on Fish and Wildlife Resources of the Bay/Delta*, Seminar, U.C. Davis (May 8, 1991).

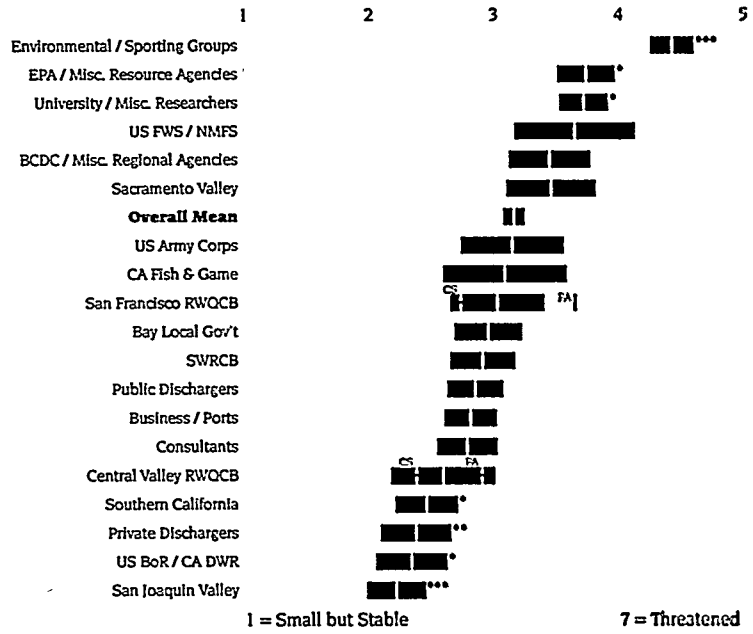

Figure 5

Mean Evaluations of Graph of Delta Smelt Populations

by affiliation category
with standard error bars and probabilities
of being different than the overall mean.

*, **, *** = significant at the .05, .01, and .001 level's respectively
All two-tailed.

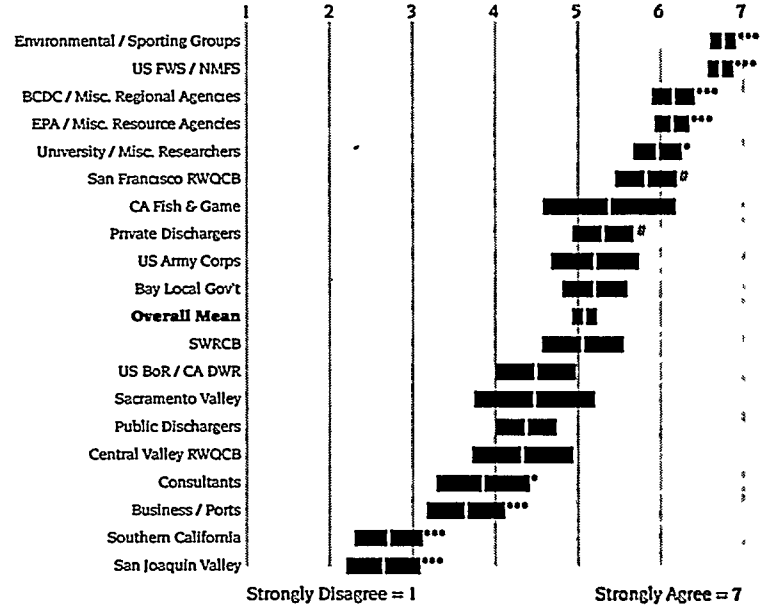

Figure 6

Perception that Endangered Species in Bay/Delta Indicate Biological Resources Under Stress

by affiliation category
with standard error bars and probabilities
of being different than the overall mean.

*, **, *** = significant at the .05, .01, and .001 level's respectively
= significant at the .1 level. All two-tailed.

cials interpreted the graph as strong evidence for either position. However, within that general consensus we find our familiar coalitions. On the "threatened" end of the scale, with means significantly different from the overall mean, were environmental groups, the EPA group, and university researchers. The other members of the environmental coalition, federal/state fisheries agencies and the BCDC group had means which were on the high side of, but not significantly different from, the overall mean. At the other end, with means significantly lower than the overall mean, were San Joaquin Valley farmers, the BOR/DWR, private dischargers, Southern California water districts, and, to a lesser extent, consultants and Bay businesses and ports.

The second perception states that "the number of potentially endangered species which live in or migrate through the Delta indicates that its biological resources are under severe stress." The mean responses for various categories are found in Figure 6.

At the low (dissenting) end of the spectrum were officials from San Joaquin farm organizations, Southern California water districts, Bay businesses/ports, consultants, and, to a lesser extent, public dischargers. BOR/DWR officials were also on the low end, but not significantly different from the overall mean. At the high (agreeing) end were environmental groups, federal (but not state) fisheries agencies, the BCDC group, the EPA group, university researchers, the SFRWQCB (especially staff), and, for some inexplicable reason, private dischargers.

The final perception concerns responses to the statement, "listing the Delta smelt as a threatened species will have extremely serious economic repercussions in the state." The means for various organizational categories are found in Figure 7.

Once again, the results reveal the usual coalitions. At the high (strongly agreeing) end are San

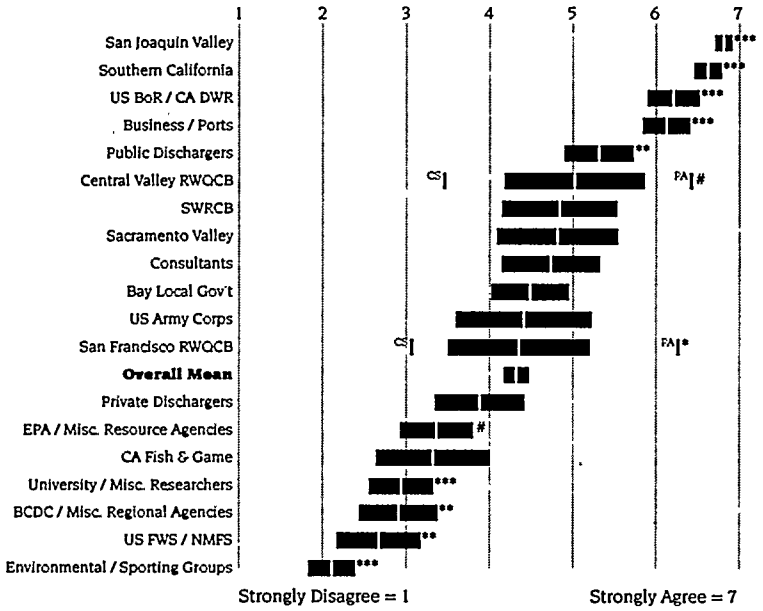

Figure 7

Perception that Delta Smelt Listing will have Serious Economic Repercussions

by affiliation category
with standard error bars and probabilities
of being different than the overall mean.

*, **, *** = significant at the .05, .01, and .001 levels respectively
= significant at the .1 level. All two-tailed

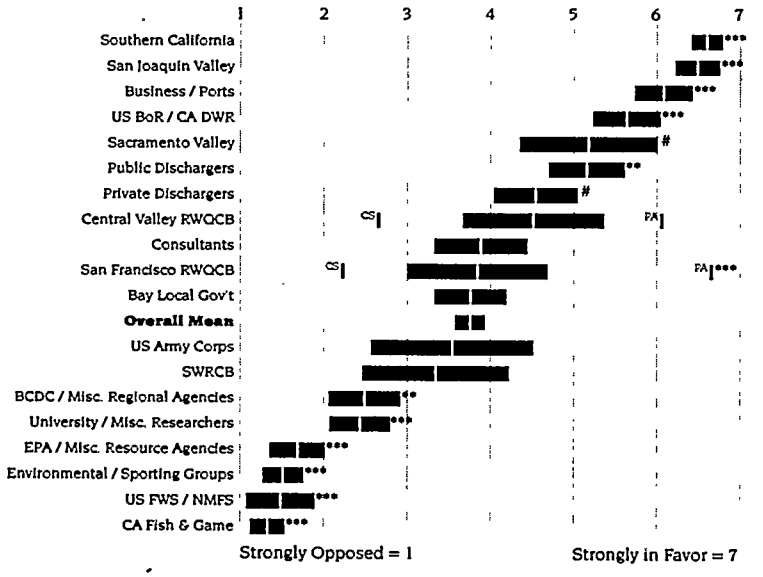

Figure 8

Attitudes Re: Amending the ESA to Include Economic Feasibility in the Listing Process

by affiliation category
with standard error bars and probabilities
of being different than the overall mean.

*, **, *** = significant at the .05, .01, and .001 levels respectively
= significant at the .1 level. All two-tailed.

Joaquin Valley farmers, Southern California water districts, BOR/DWR, Bay waterfront developers/ports, public dischargers, and political appointees (but not civil servants) from both regional water boards. At the low (disagreeing) end were environmental/sportsmens groups, the federal fisheries agencies, the BCDC group, university researchers, and, to a lesser extent, the EPA group. On this item as on the previous one, DFG officials were on the environmental end of the spectrum, but wide internal variance kept their mean from being significantly different from the overall mean.[39]

4. *Policy Preferences on Endangered Species Listings.*

Finally, we look at responses to two items dealing with the listing process. The first concerns the criteria for listing, specifically, "the Endangered Species Act should be amended to include economic feasibility in the listing of species." Responses by organizational category are found in Figure 8.

There is an extremely wide dispersion, with means ranging from a high of 6.7 for Southern California water districts to a low of 1.3 for DFG. The results also indicate the normal coalitions. At the high (strongly agreeing) end are officials from Southern California water districts, San Joaquin Valley farm organizations and water districts, the BOR/DWR, board members (but not staff) from the SFRWQCB, and three user groups from the Bay Area (waterfront businesses and ports, public dischargers, and private dischargers). At the low end are the state and federal fisheries agencies, environmental/sportsmens groups, the EPA group, and the BCDC group.

The second item concerns whether "the Delta smelt should be listed as an endangered species

39. Neither Perry Herrgesell from DFG nor Randy Brown from DWR could provide an obvious explanation for these somewhat anomalous findings. With respect to the costs of listing the smelt, part of the variance may come from differences between upper management (who are concerned with political and economic feasibility) and field-level staff, who may perceive farmers and urban districts to be wealthy enough to bear extra costs without severe repercussions.

under federal or state law."[40] The means for various organizational categories are found in Figure 9.

The results are virtually the mirror image of those regarding the use of economic criteria in the listing process. First, the means extend over almost the entire range of the 1–7 Likert scale. Second, there are the usual coalitions, with San Joaquin farmers, Southern California water districts, BOR/DWR, Bay businesses/ports, and Bay public (but not private) dischargers opposed to listing the Delta smelt. At the environmental (pro-listing) end were the federal and state fisheries agencies, environmental/sportsmens groups, the EPA group, the BCDC group, and university researchers. Interestingly, most members of the SFRWQCB opposed listing the smelt, while most staff supported it.

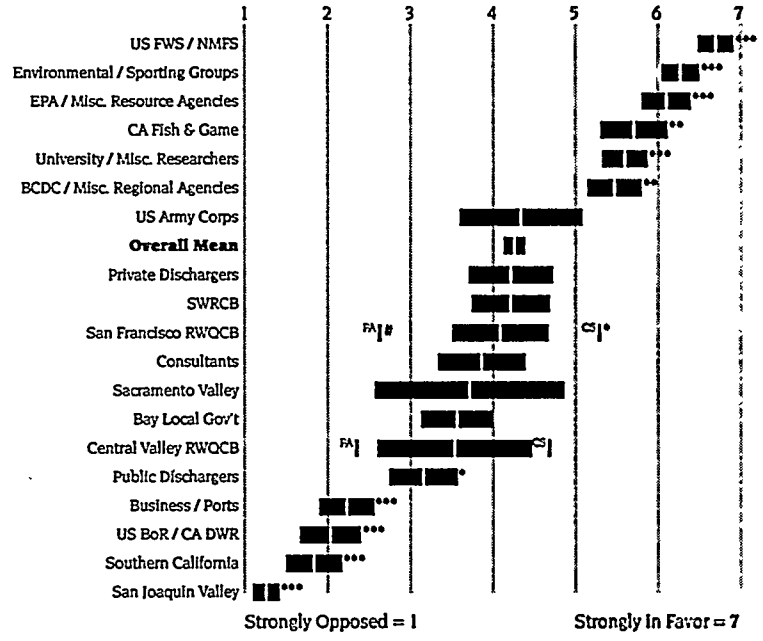

Figure 9
Attitudes Regarding Listing the Delta Smelt as Endangered
by affiliation category
with standard error bars and probabilities
of being different than the overall mean.
*, **, *** = significant at the .05, .01, and .001 level's respectively
= significant at the .1 level. All two-tailed.

Looking back over the views of policy activists on a variety of attitudinal scales related to environmental policy and endangered species, the results provide much more support for the ACF than for the CTM. First, university scientists involved in Bay/Delta water policy are clearly not neutral. On each of the nine items/scales, their mean was quite similar to that of environmental groups and significantly different from the overall mean. Second, agency officials (primarily civil servants) from most agencies were also not neutral, but, instead, tended to express views quite similar to interest groups. Officials from the BOR/DWR, Southern California water districts, and, on several items, Bay Area public dischargers tended to have views very similar to those of San Joaquin farmers and Bay waterfront businesses and ports. Likewise, officials from the two federal fisheries agencies, EPA and state/federal resource agencies, BCDC and Bay regional agencies, and, on most issues, DFG tended to express views quite similar to those of environmental groups. On the other hand, the mean values of officials from the Corps, Bay local governments, and, on most issues, the staff from the SWRCB and the two regional water boards tended to be close to the overall mean. This occurred even though individuals within those organizations certainly held views similar to those of the two coalitions.

C. Do Civil Servants Have Coherent Belief Systems?

The ACF would argue that, since most agency officials are members of coalitions, they should have policy belief systems which are roughly as coherently organized as those of interest group activists. A coherent belief system is one which integrates a wide range of propositions from the very general to the quite specific. In contrast, the CTM would argue that, since civil servants essentially do not care about public policy but simply follow the wishes of their hierarchical superiors, their policy-oriented beliefs should be much *less* coherent than those of interest group activists. These contrasting hypotheses are tested in Table 1, which provides the results from multiple regression analyses. The table indicates the relative importance of a variety of items (from the deep core Utilitarianism Scale to several specific causal perceptions) in explaining support

40. The survey occurred in the winter of 1992–93, after the smelt had been proposed for listing under the ESA but before the formal listing in March of 1993.

Table 1.

Comparing Multiple Regression Results for all Respondents and for Civil Servants on Two Endangered Species Policy Positions

EXPLANATORY VARIABLES	Support Amending the ESA to Include Economic Feasibility in the Listing of Species		Support Listing of Delta Smelt as Endangerred Species	
	Only Civil Servants (n=122)	Total (n=357)	Only Civil Servants (n=105)	Total (n=321)
Deep Core				
Utilitarian View of Nature Scale	.30**	.34***	−.12	−.22***
Policy Core				
Bay/Delta Environmental Concern Scale	.31***	−.24***	.25***	.18***
Delta Flows/Fisheries Scale	−.09	−.11**	.32***	.23***
Perceptions				
Graph Shows Delta Smelt Threatened	−.04	−.02	.12*	.11**
Listing Smelt Will Have Serious Economic Repercussion	.17*	.24***	−.17**	−.25***
Number of Potentially Endangered Species Using Delta Indicate Resources Under Severe Stress	−.05	−.02	.17*	.05
Adjusted R2	.58	.71	.76	.75
F	29	144	55	161

*, **, *** = coefficients significant at the .05, .01, .001 levels, respectively.
The coefficients are standardized regression coefficients.

for two endangered species policy proposals: (1) adding economics to the criteria for listing, and (2) supporting the listing of the Delta smelt.

The results in Table 1 generally support the ACF. In both policy proposals, the variance[41] explained by the six explanatory variables was roughly the same for civil servants as for the total population (civil servants, interest group officials, researchers, and legislators). This suggests that, at least on these two items, the belief systems of civil servants were as coherently integrated as those of other policy activists. In addition, on both items, the signs and significance levels of the standardized regression coefficients were quite comparable between civil servants and the population as a whole. This indicates that the structures of their respective belief systems regarding endangered species were quite similar.

V. SUMMARY AND IMPLICATIONS FOR POLICY

The results presented in this Paper concerning the views of Bay/Delta water policy activists in the winter of 1992–93 with respect to endangered species issues clearly provide more support for the ACF than for the CTM. Specifically, most university faculty consistently expressed views similar to those of environmental group leaders rather than being neutral.

Further, most officials from many administrative agencies[42] held views very similar to their interest group allies rather than being neutral, as represented by the population mean. On the other hand, the mean views of officials from several agencies, including Bay local governments, the Corps, and, to a lesser extent, civil servants from the SWRCB, the CVRWQCB, and the SFRWQCB, were close to the overall population mean.

A third indication in support of the ACF is that the belief systems of civil servants were similar in coherence and structure to those of other policy activists.

Finally, on endangered species issues, Bay water policy elites in 1992–93 appear to be organized into two coalitions. The first was a utilitarian coalition composed of most officials from San Joaquin Valley farmers and water districts, Southern

41. Indicated by the Adjusted R^2; it can range from 0 to a maximum of 1.0.

42. These included DWR/BOR, Southern California water districts, the two federal fisheries agencies, DFG, EPA and other state/federal resources agencies, BCDC and other Bay regional agencies, and, to a lesser extent, public dischargers in the Bay Area.

California water districts, the BOR/DWR, Bay waterfront developers/ports, and, to a lesser degree, Bay public and private dischargers and board members from the two regional water quality boards. They were opposed by an environmental coalition composed of most officials from environmental/sportsmens groups, the two federal fisheries agencies (USFWS and NMFS), university researchers, the EPA and other federal/state resources agencies, the BCDC and other Bay Area regional agencies, and, to a somewhat lesser extent, DFG.

With respect to policy implications, we start from the normative premise that the major coalitions in a policy domain (such as endangered species policy affecting the Bay/Delta) should be represented in all major implementation decisions within that domain. If one accepts this premise, the following conclusions seem to follow:

1. In forming technical advisory committees, assume that most university scientists concerned with the Bay/Delta have fairly pro-environmental belief systems. Therefore, make sure that the committee has an adequate number of scientists from institutions forming the utilitarian coalition.

2. Recognize that most officials from the USFWS, the NMFS, the EPA, and, to a lesser extent, DFG have relatively strong environmental beliefs, while most officials from the BOR and DWR have equally strong utilitarian beliefs. This may have implications for the desirability of leaving officials from either coalition solely in charge of major implementation decisions, such as the listing of a species, the development of recovery plans or biological opinions, the development of take limits, or the operation of the SWP and CVP (at least during the February–June period critical for winter-run salmon and Delta smelt).

With respect to the latter, the December 1994 compromise agreement on Bay/Delta water quality standards seems to have "foreshadowed" these concerns, at least with respect to take limits and the operation of the projects. It proposed that take limits and other operational decisions be decided by an expanded Operations Committee composed of the CVP and SWP operators and representatives from the federal and state fisheries agencies, urban and agricultural water users, and environmental groups.[43]

It also strikes us that proposals to amend the listings process to take it out of the sole jurisdiction of the USFWS and NMFS may have merit, given the strong environmental predilections of officials from those agencies. However, turning decisionmaking over to a committee of university scientists (e.g., via a National Academy of Sciences Committee) might not solve the problem. Some method needs to be developed to include professional scientists from the utilitarian coalition. At the same time, however, our major premise compels us to recommend that implementation activities fostering development potentially affecting biodiversity, such as state-level economic development and infrastructure initiatives, include members from the environmental coalition.

43. This is based upon a reading of the *Joint Proposal for Resolving San Francisco Bay-Delta Issues* (prepared by CUWA-AG in November of 1994), as amended by the *Principles for Agreement on Bay-Delta Standards Between the State of California and the Federal Government* (signed on December 15, 1994).

APPENDIX: SCALE CONSTRUCTION

The attitudinal scales utilized in this Paper have been constructed in two separate operations, one for deep core items, the other for those in the policy core.

The first factor analysis deals with 22 general items aimed at identifying fundamental normative orientations whose scope is broader than Bay/Delta water policy. These "deep core" items are derived largely from other studies and measured on 7-point Likert scales. A principle component factor analysis with varimax rotation identified three scales, one of which is utilized in this Paper. The Utilitarian View of Nature Scale involves the following seven items:

1.One person's right to a clean environment is not as important to another's right to gainful employment (r=.74).

2.Plants and animals exist primarily for man's use (r=.72).

3.Mankind was created to rule over the rest of nature (r=.68).

4.Environmental regulations should not be promulgated unless the proponents can prove that the monetary benefits will exceed the costs (r=.66).

5.We should focus primarily on protecting those species which are most interesting or important to us rather than on those which are most endangered (r=.63).

6.All species have an inherent right to exist, quite apart from any instrumental use to mankind (r=-.62).

7.Practical considerations should come first, beauty second (r=.57).

A reliability analysis on the above items produced an alpha of .88.

A second factor analysis dealt with a series of Likert-scale normative and perceptual items dealing either with Bay/Delta water issues as a whole or with critical aspects (e.g., fisheries) linked to many other aspects. A principle components factor analysis with varimax rotation identified three scales, two of which are used in this paper. The first of these "policy core" scales is a Bay/Delta Environmental Concern Scale:

1.We cannot afford to let policies claiming to promote "environmental quality" prevent the continued economic development of the Bay Area (r=–.67);

2.Protection of Bay water quality requires that regulations be rigorously enforced, even when they create hardships for dischargers (r=.65).

3.The diking and filling of wetlands in the decades prior to 1970 resulted in a serious loss of wildlife habitat in the Bay (r=.64).

4.Bay fishery populations (e.g. crab, shellfish, striped bass, smelt) are generally in good health (r=–.58).

5.The San Francisco Bay/Delta is a resource of importance to people beyond the local level, and thus should be subject to state and federal policies (r=.61).

6.Clear state and federal environmental standards are necessary because local officials in the Bay Area cannot be expected to make the difficult choices which risk harming their constituents (r=.59).

7.Local, state, and federal agencies have been successful in protecting the public trust resources (navigation, recreation, open space, wildlife, and aquatic habitat) of the Delta (r=–.54).

A reliability analysis produced a Cronbach's alpha of .85.

The second policy core scale is a somewhat narrower one concerned with Bay Flows/Fisheries:

1.Upstream dams and diversions have sufficiently reduced inflows to the Delta so as to pose serious problems to Bay/Delta fisheries (r=.67).

2.Because political power in the state lies primarily in Southern California and the San Joaquin Valley, water policy decisions by the Governor and Legislature are more likely to reflect those needs than concern with Bay water quality (r=.66).

3.In-stream flow requirements from the Sacramento River to the Bay/Delta should be sufficient to restore fish populations to pre-1976 levels (r=.52).

A reliability analysis produced a Cronbach's alpha of .78.

In constructing the above attitudinal scales, we added the scores on their items linearly and divided by the total number of items on the scale. In dealing with missing data, we retained all respondents who had answered at least one item, but changed the divisor to the number of items answered. If the respondent did not answer any of the items on a scale, her/his score on that scale was considered "missing" and not used in any of the analyses.